CLAIMS

What is claimed:

1.   A method of assessing a patient's cardiac vulnerability to sudden cardiac death using an electrocardiogram signal, the method comprising:

defining a relationship between depolarization and repolarization;

determining a first value representative of the relationship for a first beat of the electrocardiogram signal;

determining a second value representative of the relationship for a second beat of the electrocardiogram signal; and

analyzing variation between the first value and the second value to assess the patient's cardiac vulnerability to sudden cardiac death.

2.   A method as set forth in claim 1 and further comprising defining the relationship between depolarization and repolarization to include a QRS-T angle.

3.   A method as set forth in claim 2 and further comprising calculating the QRS-T angle from a set of orthoganalized X, Y, and Z leads of the electrocardiogram signal.

4.   A method as set forth in claim 1 and further comprising defining the relationship between depolarization and repolarization to include a QRS duration and a T duration.

5.   A method as set forth in claim 1 and further comprising defining the relationship between depolarization and repolarization to include a QRS duration and a QT duration.

6.   A method as set forth in claim 1 and further comprising selecting the first beat and the second beat from median beats.

7.   A method as set forth in claim 1 and further comprising selecting the first beat and the second beat from mean beats.

8.   A method as set forth in claim 1 and further comprising:

selecting the first beat from an electrocardiogram signal having a heart rate within a first range; and

selecting the second beat from an electrocardiogram signal having a heart rate within a second range that is different from the first range.

9.   A method as set forth in claim 1 and further comprising conducting a time series analysis of the first value and the second value.

10.   A method as set forth in claim 1 and further comprising using a cardiac parameter in addition to the electrocardiogram signal to assess the patient's cardiac vulnerability to sudden cardiac death.

11.   A method as set forth in claim 1 and further comprising using heart rate variability in addition to the electrocardiogram signal to assess the patient's cardiac vulnerability to sudden cardiac death.

12.   A method as set forth in claim 1 and further comprising using heart rate turbulence in addition to the electrocardiogram signal to assess the patient's cardiac vulnerability to sudden cardiac death.

13.   A method as set forth in claim 12 and further comprising using data corresponding to blood pressure change in addition to heart rate turbulence to assess the patient's cardiac vulnerability to sudden cardiac death.

14.   A method as set forth in claim 12 and further comprising calculating heart rate turbulence using a heart rate change prior to a premature ventricular contraction and a heart rate change after the premature ventricular contraction.

15.   A method as set forth in claim 12 and further comprising calculating heart rate turbulence using premature ventricular contractions, the premature ventricular contractions having varying cycle lengths.

16.   A method as set forth in claim 12 and further comprising calculating heart rate turbulence using premature ventricular contractions, the premature ventricular contractions having varying morphologies.

17.   A method as set forth in claim 12 and further comprising:

selecting the first beat from an electrocardiogram signal obtained from the patient prior to an event; and

selecting the second beat from an electrocardiogram signal obtained from the patient at least one of during and after the event;

wherein the event includes at least one of administering a pharmaceutical drug to a patient, pacing the patient using exercise, and pacing the patient using an implanted pacemaker.

18.   A method of assessing a patient's cardiac vulnerability to sudden cardiac death using an electrocardiogram signal, the method comprising:

        determining a first value representative of a QRS-T angle for a first beat of the electrocardiogram signal;

        determining a second value representative of a QRS-T angle for a second beat of the electrocardiogram signal; and

        analyzing variation of the first value and the second value using a time series analysis in order to assess the patient's cardiac vulnerability to sudden cardiac death.

19.   A method as set forth in claim 18 and further comprising using data corresponding to a cardiac parameter in addition to the electrocardiogram signal to assess the patient's cardiac vulnerability to sudden cardiac death.

20.   A device for assessing a patient's cardiac vulnerability to sudden cardiac death using an electrocardiogram signal, the device comprising:

an acquisition module that acquires an electrocardiogram signal; and

an analysis module that determines a first value representative of a relationship between depolarization and repolarization for a first beat of the electrocardiogram signal, determines a second value representative of the relationship for a second beat of the electrocardiogram signal, and analyzes variation of the first value and the second value in order to assess the patient's cardiac vulnerability to sudden cardiac death.